

PATENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

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JUL 11 2008

IN THE APPLICATION OF:

ROGER MOONS

CASE AD6883USNA
NO.:

APPLICATION NO.: 10/627902

GROUP ART UNIT: 1761

FILED: JULY 25, 2003

EXAMINER: DREW E. BECKER
CONFIRMATION NO.: 3469

FOR: IMPROVED THERMOPLASTIC POLYMERIC OVENWARE

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

DECLARATION UNDER 37 C.F.R. 1.132

1. I obtained a B.S. in Chemistry from the Polytechnic Institute of Brooklyn in 1962 and a Ph.D. in Organic Chemistry from the University of California at Davis in 1967.
2. I am currently receiving a pension from the assignee of this application E.I. DuPont de Nemours & Co., Inc. (hereinafter DuPont).
3. I am a Registered Patent Agent (No. 33,852).
4. I am currently a consultant for DuPont on technical and patent matters.
5. While consulting for DuPont I directed an experiment as set forth below.
6. A composition containing 55 weight percent of Zenite® 6000 Liquid Crystalline Polymer (available from E. I. DuPont de Nemours & Co., Inc., Wilmington, DE 19998 USA), 37 weight percent talc, and 8 weight percent carbon fiber was prepared by melt mixing in a 30 mm Werner & Pfleiderer twin screw extruder. The techniques used to prepare this composition were similar to those commonly used to prepare other compositions containing LCPs.
7. The above composition was molded in a 6 oz. HPM injection molding machine into 4 inch diameter disks.

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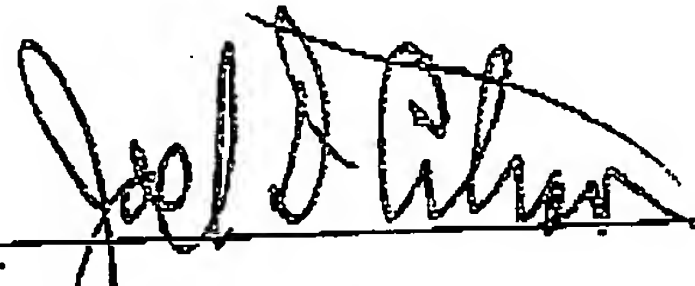
Application No.: 10/627902
Docket No.: AD6883USNA

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8. An above described disk (after machining) was tested for through plane thermal conductivity. The resulting value was 0.368 W/m²K.

9. The attached pages from Electronic Research Notebooks D100052 and D100008 describe this experiment and the conditions used for the various operations. The sample number for the above described composition was 13-1. The composition of sample 13-2 has been blanked out from the page, and the results for the thermal conductivity of this sample have been omitted.


Joel D. Citron

Date: Mar 2, 2007

T:\Patent Documents\Eng. Polymers\AD-68xx\AD6883\AD6883 Declaration of Joel Citron.doc



DuPont Electronic Laboratory Notebook

Identification Number : D100052-28.01

Experiment Name : D100052-13

Program Name : Zenite

Project Name:Thermoconductivity for Joel Citron

Document Name : D100052-13 series Thermal Conductive Zenite Joel Citron.pdf

Site Name : B2P ST

Business Unit :Engineering Polymers

Author Name : Mike J. Molitor

Date : 02/26/2007 14:59:57

Co-Author Details :

Witness Name : Adcock, Dave

Date : 02/26/2007 15:03:04

Date (GMT)	Signed by
2/26/2007 07:59:57 PM	Name: Mike J. Molitor
	Pre-Sig Hash: 9b9e723fedbb8ec913753be9ae4abc415c4f0fa1
Justification	By entering your password you verify that you planned and/or executed the work, directed the work, analyzed the result, or drew the conclusions described within this document.
2/26/2007 08:03:05 PM	Name: Adcock, Dave
	Pre-Sig Hash: 4004778267da1f14eed9d10dd217ba30817d5b91
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Justification	

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BOOK PAGE E. I. de Pont de Nemours and Company

REF 6 DE 1 INSPECTION NO. 111593-36 DATE 10-20-50

PURPOSE PERFORM TESTS

JR NO. 375	NR NO. 2	MOUSE	DATE 10-20-50	CYLINDER C 02
FOR 30101			CHARACTER 2.2	RAM SPEED 100
POLYMER TYPE 30101			SCREW C.P.	SCREW SPEED 100
MOLD 2.2			NOZZLE 2.2	BACK PRESS. 100

SAMPLE NO.	REAR	CENTER	FRONT	NOZZLE	MOLD TEMP A B	CYLINDER B C H	PRESS. FOOT. LB.	TEST	REMARKS
12-7	325	332	332	328	100 100	2 15 15	300 250		550



DuPont Electronic Laboratory Notebook

தொகுதி எண் : 2100009 32.02

Experiment Name : D100006-18

Program Name : Zenite

negative mass; thermal conductivity

Document Name : ThermalConductivityofD100052-13-1and13-2.pdf

Site Name : 500 ST

Students with Engineering Degree

Author Name : Adcock, Dave

Date : 02/25/2007 12:57:03

Co-Author Details :

Subject Name : Harvey, Pat A.

Date : 02/26/2007 12:07:04

Witness Name : Harvey, Pat A.	
Date (YYYY-MM-DD)	Time (HH:MM:SS)
2/26/2007	05:57:03 PM
Name: Andcock, Dave	Pre-Sig Hash: 0e98d8e20f9133061c0e9e10e2d613b0c072613704
By entering your password you verify that you planned and/or executed the work, directed the work, analyzed the result, or draw the conclusions described within this document.	
2/26/2007	06:07:04 PM
Name: Harvey, Pat A.	Pre-Sig Hash: 73b0cadeclbdedf82234bdc64d81ae2e301af81ba
By entering your password you will be signing to say that you have witnessed the information contained in this document	
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TEST DESCRIPTION
3100652-12-1

Injection molded disc

SAMPLE ID 12-1
SAMPLE THICKNESS 3.030mm

Average sample temperature = 50 C Controller = 30 C

TU (C)	TC (C)	TL (C)	TH (C)	TU-TL (C)	Q	RATIO
50.0	45.2	40.4	30.0	19.64	9472.1	0.21266
50.5	45.0	40.3	29.5	19.75	10096.7	0.195557
50.5	45.1	40.5	29.5	19.73	10107.1	0.195156

Average sample temperature = 75 C Controller = 35 C

TU (C)	TC (C)	TL (C)	TH (C)	TU-TL (C)	Q	RATIO
75.1	65.9	53.4	49.2	19.74	8354.4	0.233231
85.2	72.0	65.6	54.7	19.63	10161.7	0.192207
85.2	72.0	65.6	54.7	19.62	10157.3	0.193013

=====

USING CALCULATION FILE: ESI04200.ces USING FIRST ORDER FIT
USING TEST FILE : 12-1-12-1

SAMPLE ID : 12-1
SAMPLE THICKNESS : 3.030mm
CTE : 0.0005/°C

THE SAMPLE HAS A THERMAL CONDUCTIVITY OF $3.551347e-001$ W/MK
AND A THERMAL RESISTANCE OF $2.8205308e-003$ M²/W
AT A TEMPERATURE OF 50.75 C

0.345 W/MK

THE DELTA T THROUGH THE SAMPLE IS : 19.73 C
THE HEATER TEMPERATURE IS : 29.5 C
THE DELTA T ACROSS THE STACK IS : 31.50 C
THE GUARD TEMPERATURE IS : 45.10 C

=====

THE SAMPLE HAS A THERMAL CONDUCTIVITY OF $3.792624e-001$ W/MK
AND A THERMAL RESISTANCE OF $2.638385e-003$ M²/W
AT A TEMPERATURE OF 75.40 C

0.370 W/MK

THE DELTA T THROUGH THE SAMPLE IS : 19.63 C
THE HEATER TEMPERATURE IS : 54.63 C
THE DELTA T ACROSS THE STACK IS : 30.55 C
THE GUARD TEMPERATURE IS : 72.02 C



DuPont Electronic Laboratory Notebook

Identification Number : D100052-28.01

Experiment Name : D100052-13

Program Name : Zenite

Project Name:Thermoconductivity for Joel Citron

Document Name : D100052-13 series Thermal Conductive Zenite Joel Citron.pdf

Site Name : EXP ST

Business Unit :Engineering Polymers

Author Name : Mike J. Molitor

Date : 02/26/2007 14:59:57

Co-Author Details :

Witness Name : Adcock, Dave

Date : 02/26/2007 15:03:04

Date (GMT)	Signed by
2/26/2007 07:53:57 PM	Name: Mike J. Molitor
	Pre-Sig Hash: 9b9c723fedbb8ec913753bc9ae4abc415c4f0fa1
Justification	By entering your password you verify that you planned and/or executed the work, directed the work, analyzed the result, or drew the conclusions described within this document.

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BOOK PAGE E. I. du Pont de Nemours and Company

TIME 6:02 A INJECTION MOLDING DATE 10-30-50

IN 111563- 36 PURPOSE GENERAL TESTING

JR NO. 132	NB NO. 9	NO. 52	DATE 10-30-50	CYLINDER 6.02
FOR INJECTION			CHARGE 500 G. P.	RAM SPEED 500 P.M.
POLYMER TYPE 2040E			SCREW 6-P.	SCREW SPEED 500 P.M.
MOLD 2040E (E.P.)			NOZZLE 6.02	BACK PRESS 500 P.M.

SAMPLE NO.	REAR	CENTER	FRONT	NOZZLE	MOLD TEMP		CYCLE			PRESS. BOOST. P.M.	SHELT	SHEET
					A	B	D	F	N			
132	320	352	352	323	140	140	2	15	15	340	230	550

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DuPont Electronic Laboratory Notebook

Identification Number : D100052-28.01

Experiment Name : D100052-13

Program Name : Zenite

Project Name:Thermoconductivity for Joel Citron

Document Name : D100052-13 series Thermal Conductive Zenite Joel Citron.pdf

Site Name : EXP ST

Business Unit :Engineering Polymers

Author Name : Mike J. Molitor

Date : 02/26/2007 14:59:57

Co-Author Details :

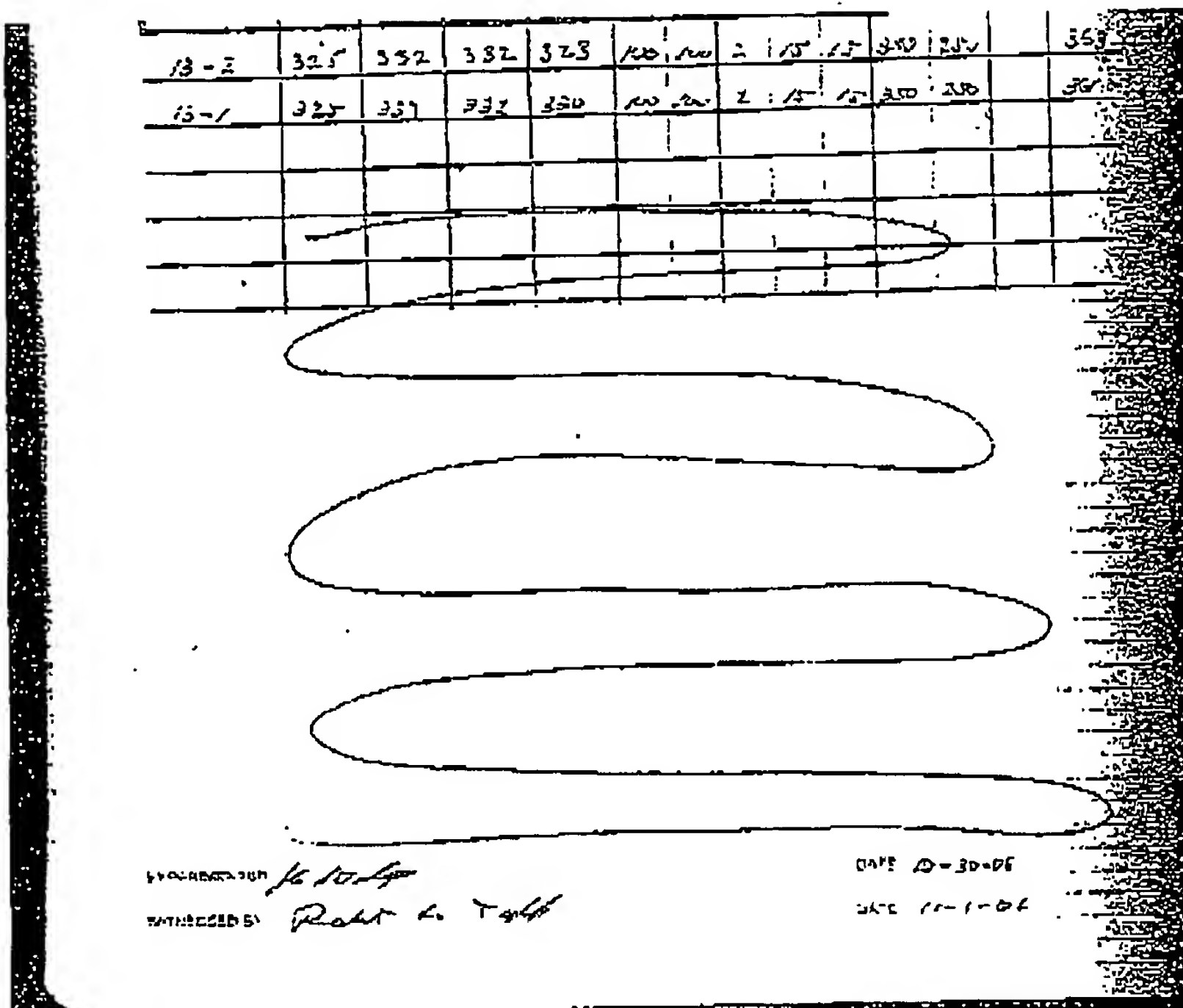
Witness Name : Adcock, Dave

Date : 02/26/2007 15:03:04

Date (GMT')	Signed by
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	Pre-Sig Hash: 9b9c723fedbb8ec913753be9ac4abce15c4f0fa1
Justification	By entering your password you verify that you planned and/or executed the work, directed the work, analyzed the result, or drew the conclusions described within this document.
2/26/2007 08:03:05 PM	Name: Adcock, Dave
	Pre-Sig Hash: 40d477b2678a1f14aed9d10dd217ba30a17d5b91
Justification	By entering your password you will be signing to say that you have witnessed the information contained in this document
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	Name:
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	Name:
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Justification	
	Name:
	Pre-Sig Hash:
Justification	

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DuPont Electronic Laboratory Notebook

Estimated Value : 5105008 21.02

Experiment Name : D100002-18

Program Name : Zanite

Next Step: The Final Conclusions

Document Name : ThermalConductivityofD100052-13-1and13-2.pdf

Site Name : EXP ST

Subsequent audit findings:

Author Name : Adcock, Dave

Date : 02/26/2007 12:57:03

Co-Author Details :

RECEIVED DATE : MAY 17, 1964.

Date : 02/26/2007 13:07:04

Signature Name : Harvey, Pat A.		Date : 02/26/2007 13:57:04
2/26/2007 05:57:04 PM	Name: Adcock, NAVA Pre-Sig Hash: 0a7b0a9b2b17233810a7e010c2023302075613704	
	By entering your password you verify that you planned and/or executed the work, directed the work, analyzed the result, or draw the conclusions described within this document.	
2/26/2007 06:07:04 PM	Name: Harvey, Pat A. Pre-Sig Hash: 73b0cadae1bdedf8234bdc64d81ae2e301af81ba	
	By entering your password you will be signing to say that you have witnessed the information contained in this document	
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	Pre-Sig Hash:	

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TEST DESCRIPTION

13-1

Infrared heated disc

SAMPLE ID

13-1

SAMPLE THICKNESS 3.030mm

Average sample temperature = 50 C Controller = 50 C

TU (C)	TG (C)	TL (C)	TH (C)	TD-TL (C)	Q	RATIO
50.0	48.2	40.2	50.0	19.84	9472.1	0.231266
50.8	48.0	40.3	29.5	19.75	10096.7	0.195657
50.6	48.1	40.9	29.6	19.73	10107.1	0.195166

Average sample temperature = 75 C Controller = 55 C

TU (C)	TG (C)	TL (C)	TH (C)	TD-TL (C)	Q	RATIO
75.1	65.8	55.4	49.2	19.74	8354.4	0.233231
65.2	72.0	55.6	54.7	19.63	8016.7	0.193207
65.2	72.0	55.6	54.7	19.62	8016.6	0.193013

=====

USING CALIBRATION FILE: BSL04200.caf

USING TEST FILE : 13-1.txt

USING FIRST ORDER FIT

SAMPLE ID : 13-1

SAMPLE THICKNESS : 3.030mm

CTE : 0.0005400

=====

THE SAMPLE HAS A THERMAL CONDUCTIVITY OF: 3.851347e-001 W/MK

AND A THERMAL RESISTANCE OF: 2.298808e-003 m2K/W

AT A TEMPERATURE OF: 50.78 C

0.365 W/mK

THE DELTA T THROUGH THE SAMPLE IS : 19.73 C

THE HEATER TEMPERATURE IS : 29.54 C

THE DELTA T ACROSS THE STACK IS : 51.10 C

THE GUARD TEMPERATURE IS : 48.10 C

=====

THE SAMPLE HAS A THERMAL CONDUCTIVITY OF: 3.702624e-001 W/MK

AND A THERMAL RESISTANCE OF: 2.183855e-003 m2K/W

AT A TEMPERATURE OF: 75.46 C

0.370 W/mK

THE DELTA T THROUGH THE SAMPLE IS : 19.62 C

THE HEATER TEMPERATURE IS : 54.66 C

THE DELTA T ACROSS THE STACK IS : 50.56 C

THE GUARD TEMPERATURE IS : 72.02 C

=====

TEST DESCRIPTION

310052-13-1

Inspection of disc

SAMPLE ID: 13-1
 SAMPLE THICKNESS: 3.030mm

Average sample temperature = 50.0 C Controller = 30 C

TU (C)	TC (C)	TL (C)	TH (C)	TH-TL (C)	Q	RATIO
50.0	49.2	49.2	30.0	19.64	5472.1	0.211266
50.6	48.0	49.8	29.5	19.75	10086.7	0.195657
50.8	48.1	40.9	29.5	19.73	10107.1	0.195166

Average sample temperature = 75.0 C Controller = 55 C

TU (C)	TC (C)	TL (C)	TH (C)	TH-TL (C)	Q	RATIO
78.1	65.9	58.4	49.2	19.74	8354.4	0.233231
66.2	72.0	65.6	54.7	18.63	10161.7	0.198207
65.2	72.0	65.6	54.7	18.62	10167.3	0.198013

USING CALIBRATION FILE: ESI04200-003 USING FIRST ORDER FIT
 USING TEST FILE: 13-1.txt

SAMPLE ID: 13-1
 SAMPLE THICKNESS: 3.030mm
 CTE: 0.0004600

THE SAMPLE HAS A THERMAL CONDUCTIVITY OF: $2.651547e-001$ W/mK
 AND A THERMAL RESISTANCE OF: $2.98203e-003$ m²K/W
 AT A TEMPERATURE OF: 50.78 C

0.365 W/mK

THE DELTA T THROUGH THE SAMPLE IS: 19.73 C
 THE HEATER TEMPERATURE IS: 29.54 C
 THE DELTA T ACROSS THE STACK IS: 31.10 C
 THE GUARD TEMPERATURE IS: 46.10 C

THE SAMPLE HAS A THERMAL CONDUCTIVITY OF: $3.702624e-001$ W/mK
 AND A THERMAL RESISTANCE OF: $2.70035e-003$ m²K/W
 AT A TEMPERATURE OF: 75.40 C

0.370 W/mK

THE DELTA T THROUGH THE SAMPLE IS: 19.62 C
 THE HEATER TEMPERATURE IS: 54.86 C
 THE DELTA T ACROSS THE STACK IS: 33.55 C
 THE GUARD TEMPERATURE IS: 72.02 C

TEST DESCRIPTION

13-1

Injection molded disc

SAMPLE ID

13-1

SAMPLE THICKNESS: 3.030mm

Average sample temperature = 50.0 C Controller = 50.0 C

TH (C)	TL (C)	TL (C)	TH (C)	TD-TL (C)	Q	RATIO
50.0	48.2	40.4	80.5	19.64	5472.1	0.21236
50.6	48.0	40.8	29.3	19.75	10026.7	0.195857
50.8	48.1	40.9	28.5	19.73	10107.1	0.195156

Average sample temperature = 75.0 C Controller = 55.0 C

TH (C)	TL (C)	TL (C)	TH (C)	TD-TL (C)	Q	RATIO
78.1	65.9	53.4	49.3	19.74	8354.4	0.233231
65.2	72.0	65.6	54.7	19.88	10161.7	0.198207
65.2	72.0	65.6	54.7	19.62	10157.3	0.193013

USING CALIBRATION FILE: ESTD04200.cab
USING TEST FILE: 13-1.tst

USING FIRST ORDER FIT

SAMPLE ID: 13-1
SAMPLE THICKNESS: 3.030mm
CTE: 0.0001000

THE SAMPLE HAS A THERMAL CONDUCTIVITY OF: 2.651347×10^{-1} W/mK
AND A THERMAL RESISTANCE OF: 2.298303×10^{-3} m²K/W
AT A TEMPERATURE OF: 50.75 C

THE DELTA T THROUGH THE SAMPLE IS: 19.75 C
THE HEATER TEMPERATURE IS: 29.31 C
THE DELTA T ACROSS THE STACK IS: 51.40 C
THE GUARD TEMPERATURE IS: 28.10 C

THE SAMPLE HAS A THERMAL CONDUCTIVITY OF: 3.702624×10^{-1} W/mK
AND A THERMAL RESISTANCE OF: 5.123325×10^{-3} m²K/W
AT A TEMPERATURE OF: 75.40 C

THE DELTA T THROUGH THE SAMPLE IS: 19.62 C
THE HEATER TEMPERATURE IS: 54.55 C
THE DELTA T ACROSS THE STACK IS: 20.55 C
THE GUARD TEMPERATURE IS: 72.02 C